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ABSTRACT

When people are asked to explain hypothetical events they tend to prefer explanations with multiple reasons (conjunctive explanations) over simple explanations. To examine this tendency, undergraduate students participated in two experiments. In the first study, students read 10 stories depicting a main character making a decision on an important course of action. The students rated the probability of seven typical and atypical explanations for the character's decision. In study two, subject's rated possible explanations for a main character completing or not completing an unimportant activity. Analyses of results demonstrated massive conjunction effects for explanations. These effects occurred for both major and minor decisions, for double and triple conjunctions, and for goals conjoined with preconditions. However, failure of action seemed to inhibit conjunction effects; giving multiple reasons for failure to complete an action (e.g., not going to a particular restaurant) may seem unnecessary. (WAS)

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Explanation via Concrete Knowledge

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This paper reports two experiments (Note 1) on the tendency for people, given the task of explaining certain hypothetical events, to prefer explanations with multiple reasons--"conjunctive explanations"--to simple explanations. Before we give the details, however, it may be helpful to set forth our general theoretical orientation toward how people attribute causes to events.

The dominant framework in attribution theory has been that of Kelley (1967), with its roots in Heider (1958), primarily contrasting the categories of dispositional (person) attribution and situational (stimulus) attribution. As is now very familiar to all students of social psychology, which type of attribution is made is said to depend on a covariation analysis of the consensus and distinctiveness information pertaining to the event in question. Of course there have been close alternatives to the Kelleyian view (Jones & Davis, 1965), additional categorical distinctions (Weiner, 1974) and reconciliations of related views (Jones & McGillis, 1976). Despite the many variations, however, throughout the enormous literature on attribution theory the dominant focus is on whether the individual makes a dispositional or situational attribution (cf. Kelley & Michela, 1980; Harvey et al., 1978; Jaspars et al., 1982).

Several criticisms (Lalljee & Abelson, 1983; Druian & Omessi, Note 2; see also Kruglanski, 1975) can be directed at this classical orientation of attribution theory. First of all, when people are given the opportunity to provide event explanations in their own words, their statements are typically hard to classify into the categories of dispositional vs. situational cause. For example, in explaining why "Michael is listening to the lecture," many subjects run by Lalljee et

al. (1982) gave complex responses such as, "Michael is so pleased at finding a lecturer who is interesting and informative that he listens to everything he says," or "Michael finds the lecture slightly dull, but listens anyway so that he doesn't miss something important in case he might need to know it later on."

Second, even for explanations which can be classified, say, as dispositional ("Mary was afraid of the dog because she was timid"), it is not clear what role the abstract category ("dispositional") plays in the search mechanism for the concrete explanation ("timid"). If the abstract category is to play a mediating role, it would have to be assumed that the individual first decides on the abstract category, and then locates a concrete response within that category. But this assumption would lead to the prediction that responses to categorical questions ("Was it because of something about Mary, or something about the dog?") should be faster than responses to concrete questions ("Was it because Mary was timid, or because the dog was vicious?"). In a reaction time experiment by Druian & Omessi (Note 2) this prediction clearly failed.

Third, it is often questionable how the relevant consensus and distinctiveness information is to be uniquely defined. The background against which covariation is to be assessed may shift. Einhorn and Hogarth (1983), invoking the concept of "causal field," give the example of an industrial worker suing the factory owners because he has contracted cancer. His lawyer cites high consensus information—a great many other workers in the same factory have gotten cancer. The defense lawyer also cites consensus information, but of a different sort, asserting that other members of the plaintiff's family have cancer

histories. This retort tries to embed the event in a genetic causal field, rather than an environmental one, and by redefining the unit of analysis from "this individual" to "this family" attempts to promote a dispositional attribution.

Fourth, it seems in many cases implausible that individuals even seek consensus and distinctiveness information. To give a somewhat flamboyant example, suppose an individual is asked to explain the event (from a news item of some years ago), "The Jewish Defense League sent a package of matzohs to the Russian Embassy on Passover." Does the individual ponder the consensus question ("Do other organizations send matzohs to the Russian Embassy?"), or the distinctiveness question ("Does the Jewish Defense League send matzohs to other embassies?"), etc.? It seems more reasonable to suppose that the individual seeks to interpret the meanings of Passover matzohs to Jews, and of the condition of Russian Jews, to decipher this somewhat cryptic act of symbolic protest. The key lies, in other words, not in a <u>covariation analysis</u> of the event, but in a <u>meaning analysis</u>.

What alternative approach to the psychology of explanation do these criticisms suggest? Our approach, which appears to be part of a newly emerging trend (Druian & Omessi, Note 2; Einhorn & Hogarth, 1983; Lalljee & Abelson, 1983; Pennington & Hastie, 1981), uses concrete, "natural" knowledge structures particular to the events in question. Especially important is the ascription to actors of concrete goal-directed behavior. While not denying the possible special role of covariation analysis in some circumstances, we believe that by and large, the process of <u>explaining</u> events is very similar to the process of <u>understanding</u> events. Our approach, then, is derivative from the

approach to the comprehension of text taken in Schank and Abelson (1977). The types of knowledge structures outlined there were scripts, plans, goals, and themes.

These knowledge structures can in principle be applied to attribution problems in a relatively straightforward way. If the event to be explained occurs within a standard script, for example, the attributor would activate the relevant script and examine the consistency of the present event with standard script events. If the event to be explained implies the presence of a particular goal, the explanation may describe how the event serves that particular goal.

Elsewhere (Leddo & Abelson, Note 3), we have reported on experiments exploring the bases for choice among possible reasons for script failure. In the present paper we focus on explanations relating to goals and plans.

Conjunctive explanations

There is some evidence and considerable theoretical sentiment for a "discounting" or "sufficiency" principle in attribution theory, such that when one reasonable explanation for an event is found, other explanations are downplayed (Kelley, 1967; Kanouse, 1972; Jones & Davis, 1965; Carlston, 1980). It is often assumed that dispositional and situational explanations trade off against one another, so that more credence given to one results in less credence for the other.

The view that people prefer single reasons to multiple reasons should not be taken for granted, however. One problem that has come to light is that situational and dispositional attributions are not true alternatives. When subjects rate their applicability separately, low negative correlations are found (cf. Taylor & Koivumaki, 1976) instead

of the near perfect negative correlation one might expect if the two types of explanations traded off.

Even more to the point for a knowledge structure view of explanations, however, is the commonsense observation that many human actions are well understood to have multiple reasons that can supplement each other. This seems to be true, for example, in much goal-directed behavior, and even in seemingly simple scripts. One goes to a restaurant to satisfy hunger, to indulge appetite, to avoid cooking, to have a change of scene, to socialize, and perhaps to celebrate. One walks for exercise, fresh air, and to get somewhere. Although the original Schank and Abelson (1977) treatment of goals dealt with them only one at a time, later analysis (Wilensky, 1983) makes a strong case that actions serving multiple goals are the rule rather than the exception. If this is true, then we should expect that explanations for intentional acts might be regarded as better, or at least more complete, when they cite multiple goals.

Presumably there is some limit to the number of different goals one might invoke to make an explanation more complete. As the potential completeness of an explanation increases by adding reasons, its plausibility may decline, since one or more of the added reasons may prove false. The appeal of completeness may be strong enough, however, to overcome a modest loss of plausibility when only two or three reasons are given, suggesting that multiple explanations may sometimes produce the "conjunction fallacy" (Tversky & Kahneman, 1982, 1983).

Objectively, the probability that two assertions are <u>both</u> true can never exceed the probability that either one alone is true. This is so because the conjoint assertion implies each component assertion, but not

vice versa. Tversky and Kahneman (1982, 1983) have identified several related classes of cases in which subjects give probability estimates which violate this conjunction rule. For example, when given a background description of Linda, a single woman generally interested in social causes, subjects typically rate it more probable that Linda is both a bank teller and a feminist than that she is a bank teller.

Tversky and Kahneman explain this type of effect as a consequence of conflicting orientations toward probability judgments. On the one hand is the objective, "extensional" orientation of classical probability theory, with its set inclusion relation that requires the conjunction rule. On the other is an intuitive, "intensional" orientation reflecting a qualitative judgment of seeming plausibility. In the Linda example, subjects are lured into an intensional orientation by the factor of "representativeness." The assertion "Linda is a feminist" is representative of the kind of thing to be expected from the background information. "Linda is a feminist," appended to "Linda is a bank teller," yields an increase in plausibility and a higher probability judgment. Subjects generally do not think to apply extensional reasoning when representative information is salient.

It seems entirely possible that the conjunction fallacy would apply to our case of conjoint explanations, as well, though mediated by completeness rather than representativeness. Because a conjoint explanation seems more complete than a simple explanation, it may gain plausibility. When subjects are asked to rate the probability that a single reason is among the factors explaining an event, and also the probability that both this reason and another reason are among the factors explaining the event, the latter judgment may exceed the former.

We adapted this probability rating task to our investigation of multiple explanations not to provide further evidence for the conjunction fallacy, which we regard as reasonably well established; rather, we used it because if we got the same striking effect, this would provide good evidence that multiple reasons are an intuitively compelling property of good explanations. Further, if conditions could be found which did not yield a conjunction effect, it would help identify factors disposing against the appeal of multiple reasons.

The experiments to be reported all compared probability ratings for conjunctive explanations with probability ratings for their component explanations. The aim was to find cases where "more was better," that is, where the conjunctive explanations were rated more probable. Henceforth we will refer to such outcomes as "conjunction effects" rather than the more pejorative "conjunction fallacies." There have been several arguments which hold that the subjects' behavior in the Tversky and Kahneman studies was not as blatantly fallacious as it first appears. We can sidestep these arguments because strictly speaking, we don't need the claim of fallaciousness to find effects of interest concerning conjunctive explanations.

Factors which may affect conjunctive explanations

An obvious factor affecting the plausibility of conjunctive explanations is the general level of plausibility of the components. In our studies, we used generally plausible components. We thought it more useful to explore as a first step how good explanations combine, rather than how poor explanations combine. We also tried to minimize obvious interactions among explanations themselves, as for example when one explanation undermines the other. ("I don't eat at that restaurant

because the food tastes like poison . . . and there's so little of it.")

Using plausible explanations with minimal mutual interaction, we varied typicality of explanations. Also manipulated were the importance of the event to be explained, and the presence/absence of the event--that is, whether what needed explaining was why something did happen vs. why something did not happen.

Our typicality factor we view as a rough analogue of Tversky and Kahneman's (1983) "representativeness." Virtually all of those investigators' conjunction effects were obtained with the combination of a representative and an unrepresentative element (e.g., "feminist and bank teller"). We wanted to see hether the combination of a typical and an atypical explanation would similarly produce conjunction effects. Additionally, however, we wanted to explore conjunctions of two different typical explanations. The analagous case of a pair of representative elements has not been treated systematically by Tversky and Kahneman.

The factors of importance and presence/absence were varied because we expected the occurrence of conjunction effects to depend on them. The nature of these expectations, and the manner of introduction of these manipulations (and others) are detailed below in the context of each experiment.

Study 1

Method

Subjects

Subjects were 38 Yale undergraduates solicited through campus

advertising. They were paid $5 for participation for one hour, filling out our questionnaire and others.

Materials

The materials used in this study were ten stories depicting a main character making a decision on an important course of action such as buying a car or choosing to attend a college. Although it was not a major focus of the study, there were two versions of each story—one with a relative choice (e.g., accepting Dartmouth rather than Brown), the other with an absolute choice (simply accepting Dartmouth), counterbalanced across subjects.

For each story (in either version), seven candidate explanations of the character's action were listed. The seven were comprised of two typical explanations, referred to as T1 and T2; an atypical explanation, A; a conjunction of a typical and the atypical explanation, T1+A; a conjunction of the two typical explanations, T1+T2; and two plausible filler explanations.

In selecting the candidate explanations the authors followed the following guidelines: the typical explanations were based on the reasons the authors perceived as most typical for doing the particular story action; the atypical explanations were chosen to be plausible but alone not ordinarily sufficient to make the choice the character made. Although these judgments were subjective on the part of the authors, the probability ratings of these explanations served as a check on the validity of these judgments. Finally, the assignment of the two typical explanations to T1 (the explanation paired with the atypical one in the conjunction) and T2 was random.

In the college story, for example, the explanations used were: T1,

John (the main character) wanted to attend a prestigious college; T2, Dartmouth offered a good course of study for John's major; A, John liked the female/male ratio at Dartmouth; T1+T2, Dartmouth offered a good course of study for John's major and John wanted to attend a prestigious college; T1+A, John wanted to attend a prestigious college and liked the female/male ratio at Dartmouth; fillers, John wanted to attend school on the east coast; the extra-curricular activities at Dartmouth matched John's interests.

Each story occurred on a single page with the explanations listed below it in random order. In the explanations involving conjunctions, the explanation component that appeared first was randomly determined. The order of the ten stories was randomized (by page shuffling) for each subject.

Procedure

Subjects were tested in groups of variable size, in a large classroom. Subjects were instructed to read each of the stories and the explanations which followed, and then to rate "the probability that the following [explanations] are among the factors which influenced (character's) decision to . . . (the story action)." Subjects were asked to rate the explanations from 0 to 100%. In addition, subjects were told that their probability ratings did not have to add to 100%, and that multiple factors may have influenced the character's decision.

Results

Conjunction Effects

Table 1 shows the total number of occurrences of conjunction

effects (cases where conjunctive explanations were rated more probable than at least one of its component explanations), and the mean probability ratings for each of the classes of explanation. (In this data presentation, we have collapsed over the relative vs. absolute story version variable, which yielded no significant effects of major consequence.)

Insert Table 1 about here

Out of 780 possible occurrences, conjunction effects occurred 578 times, or roughly 76.5% of the time. This high percentage demonstrates a general tendency for subjects to perceive conjoint explanations as more probable than their least probable components (an error, as we have noted, if judged by the standards of objective probability interpretation). These effects occur nearly equally often for the conjunction of two typical explanations, and for the conjunction of a typical and atypical explanation.

The bottom of Table 1 makes clearer the general nature of the effects. The first thing to notice is that on average the atypical explanations are indeed rated less probable than the two typical explanations, 24.6 vs. 64.4 and 65.0. The size of the difference is so great that the question of statistical significance over subjects and stories is almost academic; for the record, F' min. (Clark, 1973) equals 81.13 with 1 and 480 d.f., $p < .001$.

The conjunction of the atypical and first typical reason is on average rated at an intermediate level, 45.9. This creates a great number of conjunction effects ("errors"), because an intermediate probability level exceeds the low level at which the atypical reason is

usually rated. This pattern of ratings is similar to that obtained by Tversky and Kahneman (1982, 1983) in most of their examples, albeit they generally employed probability rankings rather than direct numerical estimates.

Meanwhile, the conjunction of the two typical reasons is on average rated at 76.9, well above the component ratings of 64.4 and 65.0. The contrast between the conjunction and the average of its components is significant over subjects and stories, F' min. = 26.20, d.f. = 1, 131, $p < .001$. This type of conjunction effect was not systematically investigated by Tversky and Kahneman. In the context of our explanation study, the effect says that if two different explanations are each fairly plausible, the explanation invoking both of them simultaneously is even more plausible (at least for the stimulus materials used).

Discussion

Study 1 demonstrates massive conjunction effects for explanations. When giving reasons why an actor made an important personal decision (choosing a college, or job, car, etc.), "more is better." These effects apply both for conjunctions of two typical reasons, and for conjunctions of a typical and an atypical reason.

At least two crucial questions can be raised, however. First, the conjunction effects could be some kind of artifact of the methodology. After all, it is difficult to explain to subjects in rating conjunctions that we want the probability that both reasons are true, possibly among others. Subjects may misinterpret the task. Second, we used a particular, limited set of events to be explained (personal choices), and we do not know to what extent a conjunction tendency generalizes. This second question is extremely important, as we certainly do not

expect conjunction effects always to hold.

Both questions can be met straightforwardly. We can change the instructions substantially, and we can explore other types of events to be explained. If other instructions also yield conjunction effects, we gain assurance of the robustness of such effects, as we do also by varying the stimulus materials. In varying materials, however, an important issue concerns when we do not get conjunction effects. When is "more" not better?

One possibility is that the sheer number of explanations may reach some optimum. Conceivably two explanations are better than one, but three explanations are worse than two, for example. Another possibility arises from the observation that sometimes an excess of explanations may seem like "gilding the lily," or "protesting too much." If one explanation is fully sufficient, giving more may weaken one's credibility. But when is one explanation sufficient? A candidate class of situations involves explanations of why something failed to happen. Typically, a single errant condition can infirm a projected course of events, whereas many conditions may need to hold properly for event completion to be achieved. Thus we might expect conjunction effects to hold for the explanation of completed events, but not for the explanation of failed events.

Study 2

The comparison of completed vs. failed events was the primary basis for our choice of materials in Study 2; additionally, we changed the content somewhat.

As for the revised instructions, we tried to be much more explicit about the proper interpretation of the probability ratings. In Study 1, we used the phrase, "probability that the following . . . were among the factors which influenced [the] decision," by direct analogy with Tversky and Kahneman's (1983) instruction for ratings of medical diagnoses: " . . . rank order the following in terms of the probability that they will be among the conditions experienced by the patient." In Study 2, this instruction was replaced by an extensive introductory explanation.

Method

Subjects

Subjects were 30 Yale undergraduates, solicited through campus advertising, and paid $5 for participation in this and other studies. At random, half the subjects were assigned each of two questionnaire versions, as explained below.

Materials

As in Study 1, ten brief stories were presented. In each, a main character was depicted making a decision. Unlike in Study 1, however, the decisions were of a relatively unimportant nature, such as whether to go to a particular restaurant. All ten stories, in fact, concerned mundane, "scripted" activities, and the character's decision was whether or not to enter the script. For half the subjects, the character decided (in all ten stories) that he would enter the activity, and for the other half, that he would not. These two respective forms of the questionnaire are referred to below as the Completed version and the Failed version.

For each story, seven candidate explanations of the character's action were listed. Explanations concerned the character's goals, and also certain preconditions. The former were much like the typical reasons of Study 1, and the latter were of a different sort from anything used before. The seven candidate explanations were comprised of one goal statement, G; two preconditions, P1 and P2; one simple conjunction, G and P1; one triple conjunction, G and P1 and P2; and two filler explanations. As before, all the single explanations were designed to have a reasonable degree of plausibility. In the Completed versions of the stories, the goal and the preconditions were all affirmed. In the Failed versions, the goal and the preconditions were all negated.

To illustrate, the restaurant story stated, "Fred was driving down the highway when he noticed an Italian restaurant up ahead. Fred stopped (did not stop) in for something to eat." The seven candidates for explaining Fred's (in)action were:

G.	Fred was (not) hungry.
P1.	He (dis)liked Italian food.
P2.	He had (no) money in his pocket.
G+P1.	Fred was (not) hungry and he (dis)liked Italian food.
G+P1+P2.	Fred (dis)liked Italian food and had (no) money in his pocket and he was (not) hungry.
Filler.	The restaurant (did not) looked/(look) respectable.
Filler.	There was (not) a gas station next to the restaurant.

Each story appeared on a separate page with the explanations listed below it in random order. In the explanations involving conjunctions, the explanation that appeared first was randomly determined. The order of the ten stories was randomized for each subject.

Procedure

Subjects were run in small groups. The general introduction preceding the stories was as follows:

> Below are several scenarios followed by possible explanations for that scenario. Your task is to imagine the scenario occurring in everyday life and try to explain why it happened using the provided explanations. Some explanations contain only one reason while others are made up of two or three reasons. For each explanation please rate on a scale of 0 to 100% how probable you think it is that the explanation constitutes at least part of the actual explanation. In the cases where two or three reasons are listed as the explanation, your rating should be the probability that all reasons together are part of the actual explanation. Your ratings should be based upon your own judgments—don't assume that any or all of the reasons we list are necessarily part of the actual explanation. We may have omitted some reasons that you think should be there or included ones you think shouldn't be there. Your ratings for each scenario don't have to add to 100%. Please give every item a rating (between 0 and 100%).

Results

Conjunction Effects

Table 2 shows the total number of occurrences of conjunction effects for double reasons (G+P1) and triple reasons (G+P1+P2), broken down by Completed and Failed actions.

Insert Table 2 about here.

It is clear that conjunction effects typify responses to the Completed actions, which were somewhat similar to the stimuli of Study 1. Such effects occur 72% of the time for double reasons, and 81% of the time for three reasons. With Failed actions, however, conjunction effects are no longer the dominant tendency, occurring only 43% of the time for double reasons and 49% of the time for triple reasons. (The

slight excess of conjunction effects for triples is attributable to the presence of one more component, possibly lowering the threshold for tallying an effect. In any case, the difference is not significant.)

The results are clearer if viewed according to mean probability ratings, as in Table 3. The first thing to note is that the probability ratings for single components are similar for the Completed vs. Failed action versions. In the Completed version, G, P1 and P2 are each rated slightly higher than in the Failed version--by 10, 5, and 11 points, respectively--but none of these differences are significant by F′ min. test. However, the behavior of the conjunctions is very different for the two versions.

For the Completed version, the mean rating (76.5) of the conjunction G+P1 is higher than <u>both</u> component means, 71.5 for G, and 48.1 for P1. The mean rating (85.0) for the triple conjunction G+P1+P2 is higher still, exceeding each of its components by a significant amount. For the Completed actions embodied in these stimulus materials, more explanation is better here in Study 2, just as it was in Study 1. By contrast, for the Failed actions, more explanation is not better. The mean ratings of the conjunctions G+P1 and G+P1+P2 fall at about the same level (around 35 or 40) as P1 or P2 alone, and considerably less than G alone. These differential patterns for the two versions yield a significant Version x Stimulus Item interaction over both subjects and stories, F′ min. = 10.75, d.f. = 1,6; $p < .05$.

<u>Discussion</u>

The results of Study 1 and Study 2 together imply a fair degree of generality for conjunction effects in the domain of explanations. Such effects occur both for the relatively important actions of Study 1

(choosing a job, a college, etc.), and the relatively trivial actions of Study 2 (going to a restaurant, a movie, etc.). They occur both for double and for triple conjunctions (Study 2), and for conjunctions both of pairs of goals (Study 1), and for goals conjoined with preconditions (Study 2). The effects are also general across probability levels of the individual components: in Study 1, two high rated reasons (T1 and T2) produced a more highly rated conjunction; in Study 2, a high rated and a medium rated reason (G and P1) produced a conjunction rated more highly than both; in Study 1, a high (T1) and a low (A) rated reason yielded a conjunction rated in between the two.

Conjunction effects are not totally ubiquitous, however. In Study 2, we managed in the Failed actions version to produce results lacking a conjunction effect tendency. The issue thereby becomes one of identifying the factor(s) crucially responsible for the lack of conjunction effects.

Certainly it seems that the failure of action is an important factor. One thing going wrong is usually enough to infirm a course of events. Thus the giving of multiple reasons for failure may be unnecessary and excessive. It seems peculiar to explain an actor's failure to go to an available Italian restaurant by saying, "He had no money and he didn't like Italian food, and he wasn't hungry."

However, we stop short of the claim that failed actions always inhibit conjunction effects. In a separate and informal pilot study, whose data are not reported here, we obtained suggestive evidence that when an actor decides against an important action (of the type in Study 1 such as accepting a particular job), conjunction effects do occur. Thus to explain why someone did not take a seemingly attractive job,

more than one reason might be needed. To account for a failure of something less consequential, however, one reason might well suffice. It is worthwhile, therefore, to vary the importance of an actor's decision, and to look for differences in the frequency of conjunction effects for failed action.

It seems reasonable that more reasons might be differentially better when there is something more consequential to be explained. We defer a full discussion of this possibility until after tallying the results of Study 3, presently in progress. Nevertheless, one comment seems worthwhile now. Einhorn and Hogarth (1983) have recently advanced an analysis of the factors underlying good causal explanations. In their system the "net strength" of an explanation is a function of its gross strength minus the gross strength of competing explanations. Einhorn (Note 4) has suggested that the reason why conjunctive explanations are generally more effective than single explanations is that conjunctive explanations coopt the alternatives. That is, a single explanation, A, may lack optimum net strength because alternative B is also plausible. When the explanation "A and B" is offered, however, it improves the net strength of A because B no longer invokes competing strength. This idea is quite appealing, provided one assumes that subjects are rating something like net strength when asked to rate probability. The analysis is complicated, though, by the lack of conjunction effects for inconsequential failures. There, one must argue that net strength of explanation is judged relative to a threshold of the strength that would be sufficient. If a single explanation already has sufficient net strength, then cooption of alternatives fails to yield further improvement. Further analysis of a threshold concept for

net strength of explanation would be desirable. An experiment addressed to this point is currently in progress.

There is another theoretical issue that warrants discussion. Given that we have found several circumstances in which multiple reasons are preferred to single reasons, what should be said about the discounting principle of attribution theory, which claims that people very generally prefer single reasons? One major difference between the stimuli of present experiments and those of past work in the attribution tradition is that our multiple reasons were compatible with each other, whereas in past research multiple reasons have often been somewhat in tension with each other. Thus, for example, in Carlston's (1980) work on trait inferences, subjects avoid attributing both honesty and rudeness to someone who offers frank criticism. Presumably there is pressure toward evaluative consistency in trait attributions. No such constraint exists, however, in attributing a choice of college (say) both to an interest in their curriculum and a respect for their prestigiousness. The issue of the mutual compatibility of sets of reasons calls for further analysis.

TABLE 1

Frequency of Conjunction Effects (Study 1)

Conjunction Type	Effect	
	Present	Absent
$T_1 + T_2$	288	92
$A + T_1$	290	90
All conjunctions	578 (76.1%)	182 (23.9%)

Magnitude of Conjunction Effects (Study 1)

	Mean Probability Ratings				
Stimulus Type:	A	T1	T2	A+T1	T1+T2
Mean Rating:	24.6	64.4	65.0	45.9	77.0

TABLE 2

Frequency of Conjunction Effects (Study 2)

	Two reasons		Three reasons	
Action version	Effect Present	Absent	Effect Present	Absent
Completed	108 (72%)	42 (28%)	122 (81%)	28 (19%)
Failed	65 (43%)	85 (57%)	73 (49%)	77 (51%)

TABLE 3

Magnitude of Conjunction Effects (Study 2)

	(Mean Probability Ratings)				
Stimulus type:	G	P1	P2	G+P1	G+P1+P2
Action version					
Completed:	71.5	48.1	43.8	76.5	84.9
Failed:	61.7	43.2	32.5	40.2	34.4

NOTES

1. These experiments were inspired by John Leddo and carried out in conjunction with John Leddo and Paget Gross.

2. Druian, P., & Omessi, E. A knowledge structure theory of attribution. Unpublished manuscript. Grinnell College, Iowa, 1982.

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